# Cave Generator Manual

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## How to use

*Go to Menu > Window > Cave Generator.*

### Display resolution:
These buttons change the display map's resolution.

### Cave map size:
Denotes the size of then next map that will be generated.

### Automatically generate level:
Generates a map. This map uses this window's settings, then it's refined 4 times, lastly all holes are removed from it.

### Map density:
It defines how much noise will be used at the first step, greater the number more walls the map will have.

### Display map:
This white square display the currently generated map. Map changes are displayed there.

### Fill tool:
At a display click, if that click was on an empty cell, that cell and every other open cell adjacent to it are filled. Completely removing a hole from the map.

### Threshold:
This double slider denotes how much alive or dead neighborhoods are needed to change the state of a cell. Higher it is, easier is to walls to became empty, lower it is easier is to walls to become full. Bigger the bar is, less changes will happen.
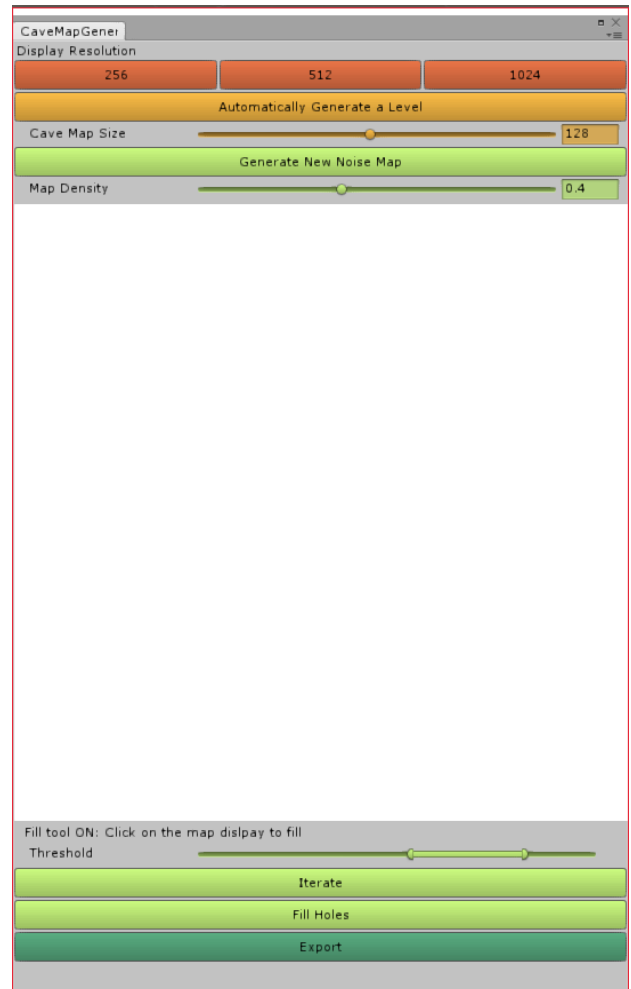
### Iterate:
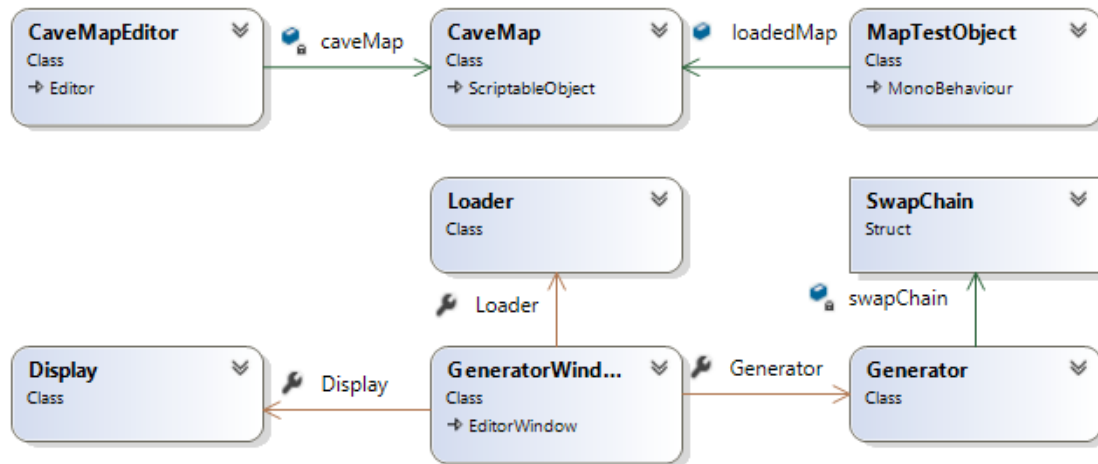Force the cellular automata to iterate and refine the map.

### Fill holes:
Automatically detect isolated holes in the map and remove them.

### Export:
Generate a special scriptable object containing the map info and the necessary handlers to deal with that information.

# Overall system architecture



## Part 1: The generator.
### Generator Window:
Contains every call necessary to draw the window. It also manages every other module.

### Display:
Encapsulates the Map display. It's made to read and display data using a dynamically generated texture.

### Loader:
Loads all the information generated into a new Map object and eject it as an asset.

### Swap Chain:
Small struct which holds 2 buffers, one is for reading and the other is for writing, those buffers have a swap mechanism to facilitate the cellular automata algorithms.

### Generator:
Holds methods that together generates a new cave layout.

## Part 2: The Map.
### Cave Map:
It's a data structure that holds all the information generated by the generator, it also has some handlers to facilitate the access of that information.

### Cave Map Editor:
Changes the editor view to show the display of the map (it also uses a display object to do so).

### Map Test Object:
Dummy object that loads one map object and project several gizmos using the information extracted from the map.